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10/569,002	02/15/2006	Mitsuhiro Kashiwabara	3712174.00518	1753

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EXAMINER	
HOLLWEG, THOMAS A	

ART UNIT	PAPER NUMBER
2879	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

chicago.patents@klgates.com

Office Action Summary	Application No.	Applicant(s)	
	10/569,002	KASHIWABARA, MITSUHIRO	
	Examiner	Art Unit	
	Thomas A. Hollweg	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,12,14-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,12,14-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 1, 2010 has been entered. No claims are added or canceled. Claims 11, 12, 14-18 and 20-23 currently pending.

2. The amendments to claim 23 are acknowledged, therefore the objections to the drawings are withdrawn.

Claim Objections

3. The following claims are objected to because of informalities:

a. Claim 20, "the blue light emitting light layer" **in line 21** of the currently amended claim, lacks antecedent basis. It is noted that "the blue light emitting layer" has proper antecedent basis. The phrase "the blue light emitting light layer" has an extra "light" between "emitting" and "layer".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 11, 12, 14-18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki, U.S. Patent Application Publication No. 2001/0031509 A1, in view of Kobori et al., U.S. Patent No. 6,285,039 B1.

6. **With regard to claim 11,** in figures 4, 5A and 5B, Yamazaki discloses an organic EL device comprising: a plurality of light emitting layers (309a-c) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order between an anode (303) and cathode (306) (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]); and an intermediate layer (402) comprised of an organic material provided in at least one location between the light emitting layers (309a-c), said intermediate layer (402) having an electron blocking property and a hole transporting property [0044-0045], see [0070-0073].

7. It is noted that layer 402, as shown in figure 4, has the effect of raising the HOMO [0044], and the region 503/504, as shown in figure 5A, also has the effect of raising the HOMO [0052]. However, in figure 4, layer 402 is shown closest to the cathode 306, and in figure 5A, region 503/504 is shown closest to the anode 105. Therefore, figures 4 and 5A show slightly different embodiments of the Yamazaki invention [0011-0012].

8. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

9. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

10. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

11. **With regard to claim 12,** in figures 4, 5A and 5B, Yamazaki discloses that a HOMO-LUMO energy gap of the intermediate layer (402, 503/504) is greater than a HOMO-LUMO energy gap of at least one material constituting the light emitting layers (309) disposed adjacent to the intermediate layer (402) (shown in fig. 5A) [0050-0054, 0070-0073].

12. **With regard to claim 14,** in figure 4, Yamazaki discloses that the intermediate layer (402) is provided at least between the green light emitting layer (309b) and the blue light emitting layer (309c) (embodiment of figure 4) [0043-0045], thereby restricting the injection of electrons into the green light emitting layer and promoting the injection of holes into the blue light emitting layer.

13. **With regard to claim 15,** in figures 4 Yamazaki discloses that a LUMO energy level of the intermediate layer (402, 503/504) having a hole transporting property is

higher than a LUMO energy level of an electron transporting component in the green light emitting layer (309b) (shown in fig. 5A) [0050-0054].

14. **With regard to claim 16,** in figures 5A and 5B, Yamazaki discloses that the intermediate layer (503/504) is provided at least between the red light emitting layer and the green light emitting layer (embodiment of figure 5A) [0050-0054], thereby restricting the injection of electrons into the green light emitting layer and promoting the injection of holes into the blue light emitting layer.

15. **With regard to claim 17,** in figures 5A and 5B, Yamazaki discloses that a LUMO energy level of the intermediate layer (503/504) having a hole transporting property is higher than a LUMO energy level of an electron transporting component in the red light emitting layer (shown in fig. 5A) [0050-0054].

16. **With regard to claim 18,** in figures 4, 5A, 5B and 8A, Yamazaki discloses a display [0075] comprising a color filter [0040] on a light take-out side of an organic EL device comprising: a plurality of light emitting layers (309a-c) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order between an anode (303) and cathode (306) (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]); and an intermediate layer (402) comprised of an organic material provided in at least one location between the light emitting layers (309a-c), said intermediate layer (402) having an electron blocking property and a hole transporting property thereby restricting the

injection of electrons into the green light emitting layer (309b) and promoting the injection of holes into the blue light emitting layer (309c) [0044-0045], see [0070-0073].

17. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

18. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

19. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

20. **With regard to claim 20,** in figures 4, 5A and 5B, Yamazaki discloses an organic EL device comprising: an anode (303); a hole transport layer (308) formed on the anode (303); a plurality of light emitting layers (309) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]) on the hole transport layer (308) such that the red light emitting layer (309a) is formed in contact with the hole transport layer (308); an electron transport layer (310) formed on the blue light emitting layer (309c); a cathode (306) formed on the electron

transport layer (310); and an intermediate layer (402) comprised of an organic material provided between the blue light emitting layer (309c) and the green light emitting layer (309b), said intermediate layer (402) having an electron blocking property and a hole transporting property, thereby restricting the injection of electrons into the green light emitting layer (309b) and promoting the injection of holes into the blue light emitting layer (309c), wherein the red light emitting layer (309a) is configured so that a portion of the holes injected through the hole transfer layer (308) are re-coupled in the red light emitting layer (309a) to give red light emission and a remainder of the holes are transported into the green light emitting layer (309b), wherein the green light emitting layer (309b) has a hole transporting property and an electron transporting property, such that some of the holes transferred from the red light emitting layer (309a) are re-coupled in the green light emitting layer (309b) to give green light emission and the remainder of the holes are transported into the blue light emitting layer (309c), and such that some of the electrons injected from the blue light emitting layer (309c) contribute to green light emission and the remainder of the electrons are transported to the red light emitting layer (309a) [0031-0035, 0040, 0044-0045, 0070-0073].

21. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

22. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

23. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

24. **With regard to claim 21,** in figure 4, Yamazaki discloses that the organic material for the intermediate layer (402) includes at least one of TPD and CPB [0071].

25. **With regard to claim 22,** in figures 4, 5A and 5B, Yamazaki discloses that the HOMO-LUMO energy gap of the intermediate layer (402) is greater than a HOMO-LUMO energy gap of all of the materials constituting the light emitting layers disposed adjacent to the intermediate layer (402) (when the appropriate materials are selected from those listed [0070-0073]).

26. **With regard to claim 23,** in figures 4, 5A and 5B, Yamazaki discloses an organic EL device comprising: a plurality of light emitting layers (309a-c) including a red light emitting layer (309a), a green light emitting layer (309b), and a blue light emitting layer (309c) laminated in respective order between an anode (303) and cathode (306) (light emitting layers are doped with fluorescent substances [0040], the three colors can be arranged in any order as long as the band structure is maintained [0073]); and an intermediate layer (401) comprised of an organic material provided in at least one location between the light emitting layers (309a-c), said intermediate layer (401) having

a hole blocking property and an electron transporting property [0044-0045], see [0070-0073].

27. Yamazaki does not expressly disclose that the green light emitting layer comprises a hole transporting material and an electron transporting material.

28. Kobori, in figure 1, teaches an organic EL device having a green light emitting layer (5) comprising a hole transporting material and an electron transporting material (col. 19, lines 38-65; col. 33, line 37).

29. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Yamazaki organic EL device where the green light emitting layer has a hole transporting property and an electron transporting property, as taught by Kobori, because a layer with these materials will be effective at recombining holes and electrons, are stable and will produce high fluorescence intensity (col. 19, lines 60-65).

Response to Arguments

30. With regard to the objection to claim 20 for lack of antecedent basis, it is presumed that the element named in line 21, "the blue light emitting light layer" is a misstatement of "the blue light emitting layer". This misstatement has not been corrected. Therefore, in the current version of claim 20, "the blue light emitting light layer" of line 21 lacks antecedent basis.

31. Applicant traverses that the 35 U.S.C. § 103(a) rejections because the prior art of record does not teach or suggest the specific color order of the light emitting layers between the anode and cathode. The applicant claims an order of red, green and blue

(RGB). Yamazaki (US 2001/0031509 A1) teaches a device having the same structure as the claimed invention having three light emitting colors, red green and blue. Yamazaki does not teach a specific order for the three colors, but rather teaches that the three colors may be arranged in any order because the three layers contain the same host material and the color of each layer is determined by the fluorescent material doped into the host material.

32. One having ordinary skill in the art would understand that there are only 6 possible orders for the three colors between the anode and the cathode (RGB, RBG, GRB, GBR, BRG and BGR). Applicant's argument is that Yamazaki has no teaching or suggestion regarding any ordering of different colored emission layers, much less the specific ordering as presently claimed. The examiner respectfully disagrees with this argument. The basis of the 35 U.S.C. § 103(a) rejections is that because there are only 6 possible orders of the three colors between the anode and cathode, Yamazaki, having no teaching of a specific order, suggests that any of the 6 possible orders may be used by one having ordinary skill in the art.

33. Applicant further traverses that the 35 U.S.C. § 103(a) rejections because the independent claims require two materials in the green light emitting layer. However two separate materials are not expressly claimed. The claims only require that the green light emitting layer comprises a hole transporting material and an electron transporting material. Where a light emitting layer comprises a material, such as the material taught by Kobori et al., (U.S. 6,285,039), where the material is a hole transporting material and

is an electron transporting material, this claim limitation is satisfied. For these reasons Applicant's arguments are not found to be persuasive.

Conclusion

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Hollweg whose telephone number is (571) 270-1739. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm E.S.T..

35. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

36. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TH/

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